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Euan C. Smith

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EXAMINER

LEE, BRENITRA M

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/591,363	Applicant(s) SMITH ET AL.	
	Examiner BRENITRA M. LEE	Art Unit 2889	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 September 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>06 November 2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the applicant's communication filed on 01 September 2006. In virtue of this communication, claims 1-18 are currently presented in the instant application.

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 06 November 2006 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the encapsulating layer and the planar substrate as stated in claim 3 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

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and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 2 and 3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 2 does not further limit the independent claim 1. Claim 1 narrows the claim by stating the value of x in $R=xT$, however, claim 2 only claims the equation with no further limitations. Appropriate correction is required.

7. Claim 3, which depends upon claim 1, states that a planar substrate has a front and back surface in which the light emitting portions are disposed on the front surface and the microlens is disposed on the back surface of the substrate. Claim 1, states the light coupling layer has a front and back surface in which light emitting portions are disposed on the front surface and the microlens is disposed on the back surface of the

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substrate. It is unclear what the applicant is portraying as the invention. Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 2, 4, 10, 14 and 16-17 rejected under 35 U.S.C. 102(b) as being anticipated by Chishio et al (Japanese Patent Publication 10-172756).

With respect to claim 1, Chishio et al. discloses in Figure 1, an OLED device (10) comprising: at least one pixel (See Figure 1); a planar light coupling layer (3) having a front surface and a back surface, said layer having a thickness T (para. 0047, lines 1-3 (200 μm)), a light emitting portion for each pixel (4) disposed on the back surface of the light coupling layer (3) (See Figure 1); and a microlens (2) for each pixel, having a radius of curvature R (para. 0037, lines 3-4 (50 μm)), disposed on the front surface of the light coupling layer (3) such that its center of curvature is within the light coupling layer (3), wherein the radius of curvature R and the thickness T are such that $R=xT$, where x has a value in the range from 0.2 to 0.8 (***with the values given, $x = 0.25$***).

With respect to claim 2, Chishio et al. discloses all the limitations as expressly recited in claim 1, and further discloses, as best interpreted, the OLED device being a bottom emitter (abstract) in which the light coupling layer is a planar substrate, and comprising: a planar substrate (3) having a front surface and a back surface, said

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substrate having a substrate thickness T (para. 0047, lines 1-3 (200 μm)); a light emitting portion (4) for each pixel (See Figure 1), disposed on the back surface of the substrate (3); and a microlens (2) for each pixel (See Figure 1), having a radius of curvature R (para. 0037, lines 3-4 (50 μm)), disposed on the front surface of the substrate (3) such that its center of curvature is within the substrate, wherein the radius of curvature R and the substrate thickness T are such that $R=xT$.

With respect to claim 4, Chishio et al. discloses all the limitations as expressly recited in claim 1, and further disclose the microlens (2) is centered over the light emitting portion (4) (See Figure 1).

With respect to claim 10, Chishio et al. discloses all the limitations as expressly recited in claim 1, and further disclose the microlens is a planoconvex lens (abstract).

With respect to claim 14, Chishio et al. discloses all the limitations as expressly recited in claim 1, and further discloses the material of at least one of the light emitting layer and the microlens is glass or polycarbonate (abstract).

With respect to claim 16, Chishio et al. discloses all the limitations as expressly recited in claim 1, and further disclose the light coupling layer (3) defines an array of pixels having a pixel pitch P , and each microlens (2) is disposed on the front surface of the light coupling layer (3) such that its center of curvature within the light coupling layer is at, or at a distance D from, the front surface of the light coupling layer (3) such that $D=zT$ wherein $D=R\sqrt{(1-1/2y^2)}$; y is defined by R/P ; and $z=0.2-0.8$ (para. 0037; **$P = 100\mu\text{m}$, $r = 50 \mu\text{m}$ therefore $y = 0.5$, which leads to $D = 50 \mu\text{m}$ and $z = 0.25$).**

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With respect to claim 17, Chishio et al. discloses all the limitations as expressly recited in claim 16, and further disclose the thickness T and the pixel pitch P are such that $T=aP$, where a has a value in the range from 0.4 to 2.5 (para. 0037, **$T = 200 \mu\text{m}$ and $P = 100 \mu\text{m}$, therefore $a = 2.0$**).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 5-9, 12-13, 15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chishio (Japanese Patent Publication 10-172756).

With respect to claim 5, Chishio discloses the claimed invention except x is in the range from 0.4 to 0.6. It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the thickness of the light coupling layer or the

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radius of the microlens to give the value of x , since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

With respect to claim 6, Chishio discloses the claimed invention except x is in the range from 0.45 to 0.6. It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the thickness of the light coupling layer or the radius of the microlens to give the value of x , since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

With respect to claim 7, Chishio discloses the claimed invention except x is in the range from 0.47 to 0.55. It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the thickness of the light coupling layer or the radius of the microlens to give the value of x , since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

With respect to claim 8, Chishio discloses the claimed invention except x is in the range from 0.49 to 0.55. It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the thickness of the light coupling layer or the radius of the microlens to give the value of x , since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

With respect to claim 9, Chishio discloses the claimed invention except x is in the range from 0.5. It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the thickness of the light coupling layer or the radius of the microlens to give the value of x , since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

With respect to claim 12 and 15, Chishio discloses all the limitations as expressly recited in claim 1. Chishio does not state the index of refraction of the light coupling layer. However, it is disclosed the light coupling layer (3) is formed of glass (abstract) which typically has a refractive index of 1.5. It is well known that a material with a high index of refraction will not transmit light. Therefore, having the material made of glass with an index of refraction at approximately 1.5 will ensure the transmission of light through the layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the OLED device of Chishio and have the index of refraction at approximately 1.5 to ensure the transmittance of light.

With respect to claim 13, Chishio discloses all the limitations as expressly recited in claim 1. Chishio does not state the index of refraction of the microlens. However, it is disclosed the light coupling layer (3) is formed of glass (para. 0012, lines 3-4) which typically has a refractive index of 1.5. It is well known that a material with a high index of refraction will not transmit light. Therefore, having the material made of glass with an

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index of refraction at approximately 1.5 will ensure the transmission of light through the layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the OLED device of Chishio and have the index of refraction at approximately 1.5 to ensure the transmittance of light.

With respect to claim 18, Chishio discloses the claimed invention except P is in the range from 0.2 to 0.4 mm and the thickness T is in the range from 0.3 to 1.0 mm. It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the thickness of the light coupling layer or the radius of the microlens to give the value of x, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

13. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chishio et al. (Japanese Patent Publication 10-172756) in view of Shinichi (Japanese Patent Publication 2004-039500).

With respect to claim 11, Chishio et al. discloses all the limitations as expressly recited in claim 1. Chishio et al. does not disclose the microlens is a Fresnel lens.

Shinichi discloses the microlenses is a Fresnel lens in order to condense the light emitted from the organic electroluminescence film and ensuring an angle which does not carry out total internal reflection (para. 0064)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the OLED device of Chishio et al. and make the

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microlens a Fresnel lens to condense the light emitted from the organic electroluminescence film and ensuring an angle which does not carry out total internal reflection.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRENITRA M. LEE whose telephone number is (571)270-7552. The examiner can normally be reached on Monday-Friday 7:30 am - 6:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Toan Ton can be reached on 571-272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BRENITRA M. LEE/
Examiner, Art Unit 2889

/Karabi Guharay/
Primary Examiner, Art Unit 2889

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